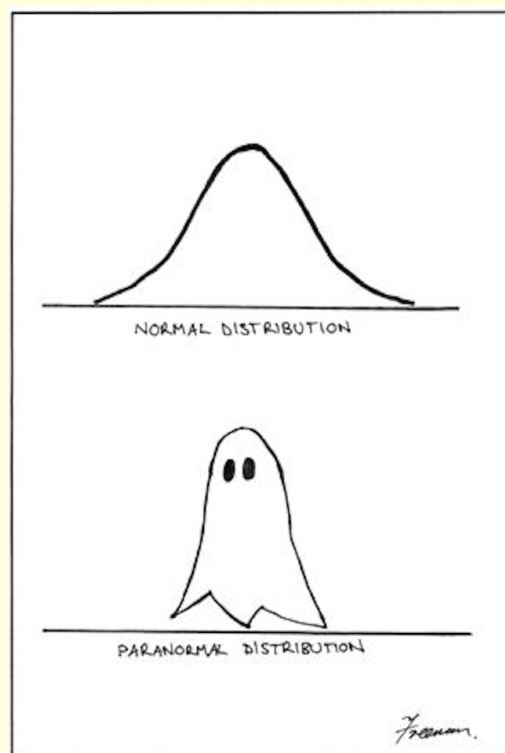


5.1 The Normal Distribution: Finding Boundaries



The Normal Distribution

Last class, you used your GDC and normcdf to find the area (or probability) underneath the normal curve given certain boundary conditions.

Today you will reverse that process. Given you know the probability (or area) of a particular event, can you find the boundary conditions? You will use invNorm:

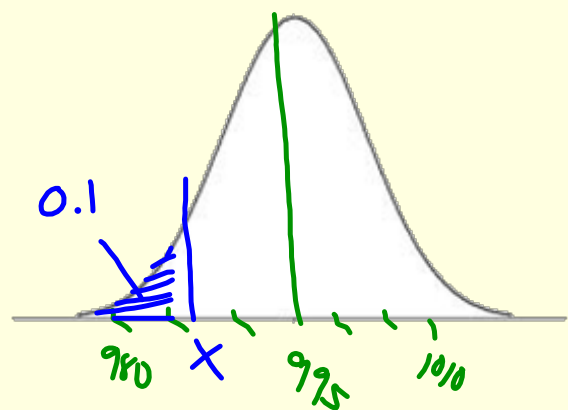
0 5 1 2 DRAW	
1: normalpdf(
2: normalcdf(
3 invNorm(invNorm
4: invT(area:
5: tpdf(μ :
6: tcdf(σ :
7 \downarrow X^2 Pdf(Paste

The "area" must always be entered as the area to the left of the boundary you are looking for. That means you might have to do some calculations first. And you should always sketch the curve and shade an approximation of the area.

The Normal Distribution

The volume of cartons of milk is normally distributed with a mean of 995 ml and a standard deviation of 5 ml. It is known that 10% of the cartons have a volume less than x ml.

Find the value of x .



$\text{INVNORM: area: } 0.1$

$$\mu = 995$$

$$\sigma = 5$$

$$x = 988.6 \text{ ml}$$

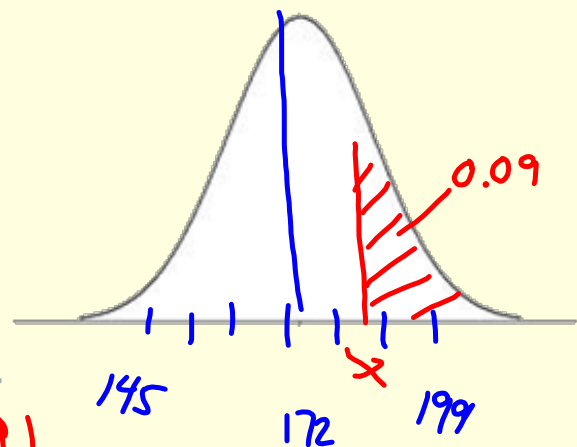
The Normal Distribution

The heights of candidates for the post of air hostess are normally distributed with a mean of 172 cm and a standard deviation of 9 cm. Nine percent of candidates are rejected for being too tall.

Find the critical height for an air hostess.

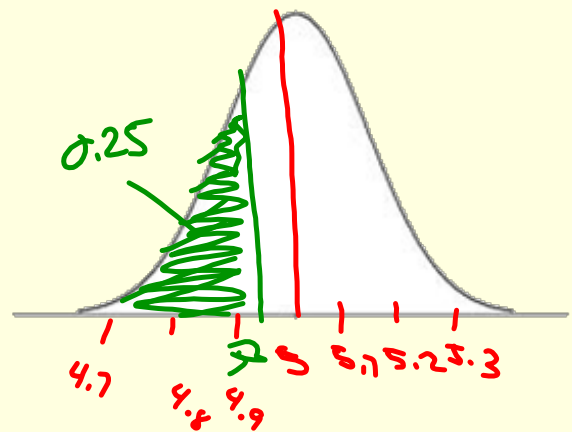
$$\text{area to left: } 1 - 0.09 = 0.91$$

$$x = 184 \text{ cm}$$



The Normal Distribution

The mass of coffee grounds in super-strength coffee bags is normally distributed with a mean of 5 g and a standard deviation of 0.1 g. It is known that 25% of the coffee bags weigh less than p grams. Find the value of p .



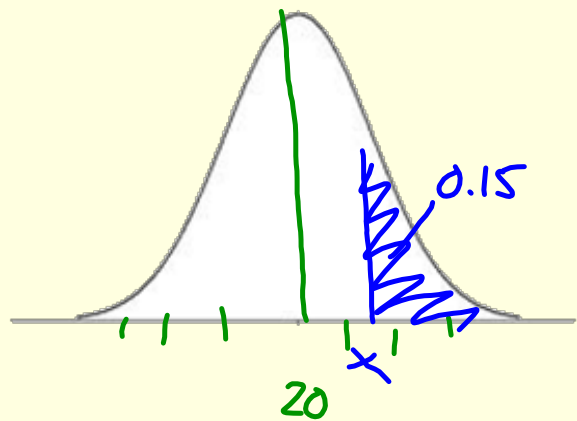
$$p = 4.933 \text{ g}$$

The Normal Distribution

The weight of kumquats is normally distributed with a mean of 20 g and a standard deviation of 0.8 g. The largest 15% of kumquats are sold to hotels. Find the minimum weight for kumquats sold to hotels.

$$1 - 0.15 = 0.85$$

$$x = 20.83 \text{ g}$$



Homework: page 214-216: 5-10 all